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PRINTED FROM THE JOURNAL OF
THE ROYAL ASTRONOMICAL
SOCIETY OF CANADA.
NOVEMBER-DECEMBER, 1911

A NOTE ON ϕ PERSEI

BY

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A NOTE ON ϕ PERSEI

By J. B. CANNON

IN a paper, "Über das Spectrum und die Radialgeswindigkeit von ϕ Persei," *A. N.*, No. 4442, Mr. Ludendorff publishes a solution of [illegible] system. His main curve goes up at its maximum to ab[illegible] nd down at its minimum to about − 33. In the work [illegible] here on this star, (this JOURNAL, Vol. IV., No. 3), the maximum found was + 42 and the minimum − 18. This seemed so great a difference that a few plates were taken this year the measures of which might be some check on the work of last year. Seven plates were taken with this end in view and their measures are given below together with the date, phase and residual from the curve formerly derived.

Plate Number	Julian Day	Velocity	Phase	Residual O-C
4485	2419200·86	− 5·0	84·04	+ 13·5
4490	203·77	− 22·0	87·85	− 4·0
4494	266·88	− 16·4	90·06	− 0·9
4549	293·76	+ 33·4	117·84	+ 4·4
4550	293·76	+ 29·8	117·84	+ 0·8
4582	300·79	+ 44·4	124·87	+ 1·9
4583	300·79	+ 41·7	124·87	− 0·8

As will be seen from the residuals given above, these measures fit in with the curve given in the former paper very well indeed. The first measure gives a rather large residual but it was a poor plate. The others are very satisfactory.

In order to get an idea of the reliability of these measures at maximum and minimum, all the plates at these two points were grouped and the probable error of an average plate found in each case. At the maximum, plates were taken from phases 117 to 132, and at the minimum from 76 to 90. The probable errors found were respectively ± 2·0 and ± 4·6, the latter being much

greater on account of the character of the spectrum at this point. These compare very favorably with the probable error of an average plate over the whole orbit, that being ± 4·1. It will be noted that at the minimum region there were two plates omitted in the determination of the probable error. These were Nos. 2377 and 2616, which had abnormal residuals of opposite sign, being + 20 and − 22 respectively. They would of course, if included, raise the probable error considerably but could hardly be considered average plates. As far as the position of the minimum is concerned, and it is this position which we are discussing here particularly, the two plates, being of opposite sign, could not effect it in the least.

MEASURES OF φ PERSEI AT MAXIMUM

Plate Number	Phase	Velocity	Wt.	Residual	Plate Number	Phase	Velocity	Wt.	Residuals
2012	121·63	+ 36·4	5	− 0·6	3055	125·08	+ 44·0	6	+ 2·3
2505	120·08	+ 32·6	3	3·0	4549	117·84	+ 33·4	8	+ 4·4
2753	120·87	+ 39·8	6	+ 3·8	4550	117·84	+ 20·8	7	+ 0·8
2762	122·81	+ 36·4	8	3·0	4582	124·87	+ 44·4	7	+ 1·0
2764	125·83	+ 50·3	4	+ 7·3	4583	124·87	+ 41·7	7	− 0·8
3054	125·08	+ 45·6	6	+ 3·0					

MEASURES OF φ PERSEI AT MINIMUM

Plate Number	Phase	Velocity	Wt.	Residual	Plate Number	Phase	Velocity	Wt.	Residual
2022	77·85	− 18·9	4	− 1·3	2044	80·24	11·8	2	+ 6·0
2032	78·93	− 22·7	4	− 4·7	2045	80·24	− 18·0	4	+ 0·4
2043	80·89	− 16·9	5	+ 2·0	2052	83·28	− 8·6	5	+ 10·6
2050	84·85	− 16·7	5	+ 1·9	2053	83·28	− 15·4	7	+ 3·2
2051	84.85	− 23·5	5	− 4·6	2054	83·28	17·4	6	+ 1·2
2061	85·93	− 13·0	5	+ 5·6	2062	86·10	6·3	7	+ 11·9
2064	90·82	− 29·7	7	14·3	2063	86·10	− 5·5	3	+ 12·7
2068	91·77	− 12·8	7	+ 1·8	4485	84·04	− 5·0	4	+ 13·5
2035	76·24	− 7·6	3	+ 9·4	4490	87·85	− 22·0	8	4·0
2036	76·24	− 18·5	4	− 1·5	4494	90·90	16·4	8	0·9

There now follow the measures on which the former paper was based. These were not published at that time, and it was thought that they might prove of some value in connection with any work being done on this star at a later date.

Summary of Measures of ϕ Persei

Plate Number	Julian Day	Velocity	Wt.	Phase	Residual O–C
1936	2418278·60	+ 11·7	6	114·68	− 10·0
2012	285·55	+ 36·4	5	121·03	− 0·6
2028	292·55	+ 38·9	8	2·13	− 4·0
2042	294·58	+ 40·4	8	4·16	± 0·0
2053	297·62	+ 36·9	6	7·20	± 3·6
2088	313·48	+ 2·6	7	23·06	+ 2·6
2136	322·50	− 5·2	7	32·08	− 1·8
2167	325·57	+ 5·7	8	35·15	+ 8·7
2168	325·57	+ 7·4	6	35·15	+ 10·4
2221	341·45	+ 3·8	8	51·03	+ 6·0
2236	346·45	+ 2·1	7	56·03	+ 7·1
2377	381·55	+ 5·3	5	91·13	+ 20·3
2406	388·54	− 17·4	4	98·12	− 10·6
2426	389·56	− 12·6	6	99·14	− 7·0
2505	410·50	+ 32·6	3	120·08	− 3·0
2515	420·88	+ 40·4	4	3·96	± 0·0
2516	420·88	+ 38·1	5	3·96	− 2·3
2531	425·70	+ 41·9	3	8·84	+ 9·5
2534	425·86	+ 42·8	3	8·94	+ 10·4
2550	458·84	− 6·9	6	41·92	− 5·3
2561	465·83	− 3·7	2	48·91	− 1·7
2570	472·83	− 11·8	9	55·91	− 9·8
2603	486·83	− 12·5	4	69·91	− 1·3
2616	492·81	− 38·7	5	75·89	− 21·7
2622	494·77	− 18·9	4	77·85	− 1·3
2632	495·85	− 22·7	4	78·93	− 4·7
2643	497·81	− 16·9	5	80·89	+ 2·0
2650	501·77	− 16·7	5	84·85	+ 1·9
2651	501·77	− 23	5	84·85	− 4·6
2661	502·85	− 13	5	85·93	+ 5·6
2664	507·74	− 29·7	7	90·82	− 14·3
2668	508·69	− 12·8	7	91·77	+ 1·8
2673	514·78	− 7·8	9	97·86	− 0·6
2678	515·72	− 12·3	8	98·80	− 6·5
2692	518·80	− 14·9	8	101·88	− 13·9
2707	521·80	+ 5·6	7	104·88	+ 1·2
2713	522·80	+ 4·3	8	105·88	− 1·7
2714	522·80	+ 1·7	9	105·88	− 4·3
2727	525·82	+ 14·6	7	108·90	+ 2·6
2728	525·82	+ 15·6	6	108·90	+ 3·6
2732	528·83	+ 13·5	6	111·91	− 4·0
2733	528·83	+ 17·6	7	111·91	− 0·1
2742	529·83	+ 22·2	7	112·91	+ 3·2
2749	531·73	+ 22·0	8	114·81	± 0·0
2753	537·79	+ 39·8	6	120·87	+ 3·8
2762	539·73	+ 36·4	8	122·81	− 3·0
2764	542·75	+ 50·3	4	125·83	+ 7·3
2769	545·72	+ 45·3	5	2·30	+ 2·3
2785	564·62	− 0·2	3	21·20	− 2·4
2786	564·62	+ 1·1	6	21·20	− 1·1
2787	564·62	− 2·3	5	21·20	− 4·5
2797	567·82	− 12·6	5	24·40	− 11·2

SUMMARY OF MEASURES OF φ PERSEI—(*Continued*)

Plate Number	Julian Day	Velocity	Wt.	Phase	Residual O-C
—					
2803	2418570·73	− 13·2	6	27·31	10·2
2804	570·73	− 8·5	8	27·31	5·5
2812	571·03	2·8	5	28·21	+ 0·2
2813	571·03	− 4·9	7	28·21	− 1·9
2820	574·74	+ 0·2	7	31·32	+ 3·6
2823	577·07	− 0·0	8	34·25	+ 3·4
2824	577·07	+ 5·6	7	34·25	+ 9·0
2827	578·78	− 1·4	6	35·30	+ 1·9
2828	578·78	+ 1·1	5	35·30	+ 4·1
2833	580·62	+ 0·9	7	37·20	+ 3·4
2834	580·62	− 0·2	6	37·20	+ 2·3
2840	584·61	− 0·2	6	41·27	+ 1·2
2841	584·61	+ 7·9	6	41·27	+ 9·3
2853	589·58	7·5	5	43·14	6·1
2854	586·58	0·0	6	43·14	+ 0·8
2870	588·[illegible]	4·5	6	45·23	− 3·6
2871	588·00	+ 4·4	6	45·24	+ 5·0
2880	592·78	− 0·9	9	49·30	+ 1·4
2881	592·78	− 3·5	7	49·30	1·5
2885	595·79	− 5·3	9	52·37	1·9
2886	595·79	10·7	8	52·37	− 3·3
2893	599·77	− 6·0	[illegible]	[illegible]	[illegible]
2894	599·77	− 7·8	[illegible]	[illegible]	2·8
2903	600·73	4·0	[illegible]	[illegible]	1·6
2904	600·73	− 0·1	[illegible]	[illegible]	0·5
2911	607·57	− 0·9	5	[illegible]	+ 0·5
2912	607·57	− 8·5	5	[illegible]	+ 1·0
2914	608·70	− 13·7	7	[illegible]·28	2·7
2915	608·70	− 11·1	7	[illegible]·28	0·1
2925	609·81	11·0	7	[illegible]	+ 0·6
2926	609·81	− 8·3	3	[illegible]	3·3
2930	615·57	− 7·8	4	[illegible]	7·2
2931	615·57	− 11·3	5	[illegible]	+ [illegible]
2935	619·60	− 7·6	3	[illegible]	+ [illegible]
2936	619·66	− 18·5	4	[illegible]	[illegible]
2944	623·66	− 11·8	2	80·[illegible]	[illegible]
2945	623·66	− 18·0	4	80·[illegible]	[illegible]
2952	626·70	− 8·6	5	83·28	
2953	626·70	− 15·4	7	83·28	
2954	626·70	− 17·4	6	83·28	
2962	629·52	− 6·3	7	86·10	
2963	629·52	− 5·5	3	86·10	[illegible]
2973	637·55	− 0·4	5	94·13	[illegible]
2974	637·55	− 0·4	7	94·13	[illegible]
2976	637·55	− 14·0	7	94·13	[illegible]
2989	642·50	− 11·6	9	99·08	[illegible]
2990	642·50	− 12·7	9	99·08	[illegible]
3020	651·60	+ 15·6	10	108·18	[illegible]
3032	657·61	+ 20·8	5	114·19	[illegible]
3033	657·61	+ 21·9	5	114·19	[illegible]
3034	657·61	+ 16·2	7	114·19	[illegible]
3051	659·79	+ 24·0	4	116·37	[illegible]

SUMMARY OF MEASURES OF φ PERSEI—(*Continued*)

Plate Number	Julian Day	Velocity	Wt.	Phase	Residual O-C
3052	2418659·79	+ 32·8	4	116·37	+ 7·2
3054	668·50	+ 45·6	6	125·08	+ 3·0
3055	668·50	+ 44·9	6	125·08	+ 2·3
3062	670·56	+ 43·4	7	0·64	0·6
3078	672·52	+ 38·2	5	2·60	- 4·6
3079	672·52	+ 33·9	7	2·60	- 8·4
3082	676·50	+ 44·4	7	6·58	+ 12·0
3083	676·50	+ 41·2	6	6·58	+ 8·7
3088	682·51	+ 31·5	4	12·59	+ 11·
3089	682·51	+ 5·9	4	12·59	- 14·
3095	684·48	+ 5·8	3	14·56	8·(
3096	684·48	- 0·6	3	14·56	- 15·0
3097	684·48	+ 14·8	4	14·56	0·4
3109	686·72	+ 11·9	5	16·80	- 1·0
3110	686·72	+ 10·6	5	16·80	- 0·6
3124	687·76	+ 5·4	7	17·84	2·0
3152	700·53	- 2·6		30·61	- 0·8
3153	700·53	- 0·7	7	30·61	+ 2·7

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